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Vol XII, p 200

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# *Large ovarian tumours in a seven months' child.*

By Alban Doran.

[With Plate XVII.]

These tumours were removed, after death, from a seven months' child, which survived its birth but a few minutes. The mother was a multipara under the care of Mr. Charles Hooper, of Aylesbury, in March, 1888. The abdomen was distended, the subcutaneous veins were prominent. The integuments above the level of the umbilicus were discoloured through ecchymosis. On opening the peritoneal cavity much ascitic fluid escaped, and two large ovarian tumours were discovered; the larger was on the left side. The liver appears to have been large even for a fœtus, the kidneys and spleen were healthy. There was a hernial sac, containing nothing but fluid, in each inguinal canal.

The left tumour was presented by Mr. Knowsley Thornton to the Museum of the College of Surgeons (Path. Ser., No. 4498 d). The donor kindly committed it to my charge whilst it was still fresh, and I at once directed Mr. Lewin to prepare the coloured sketch which I exhibit this evening (Pl. XVII, fig. 1). The action of spirit on the delicate embryonic tissues of the specimen has altered its original appearance and destroyed its natural colour.

This tumour when fresh strongly resembled a small cystic kidney. The Fallopian tube, very thin but nearly an inch long, the intervening portion of the broad ligament, and a small portion of the uterus lay on its upper surface, and are represented in the coloured sketch. A great part of the tube was inadvertently cut away; the fimbriated extremity and the piece of uterus remain; fortunately the sketch was taken before this mutilation. The tumour measured three and a half inches horizontally by two and a half vertically. When fresh it was of a uniform bright pink colour, faintly tinged with lilac. Its surface showed numerous minute elevations, as though produced by small cysts, and was free from any adhesion or evidence of peritonitis. On laying the tumour open, it was found to consist of a thin shell of solid material enclosing a large central cavity. This cavity contained clear fluid which had been emptied out before the specimen came into my hands; its wall was quite smooth. Excepting at one point on the lower part of the anterior surface, the wall or solid part of the tumour was nowhere over an eighth of an inch in thickness. It has become yet thinner through draining away of its fluid contents and the action of spirit. The cut surface displayed a reticulated rather than a cystic structure; at the point mentioned above where the tumour substance was dilated, I found an irregular cavity, nearly one inch long, with imperfect loculi. Thus, thin though the wall was, it greatly exceeded the wall of an ordinary multilocular cyst in thickness, and was perfectly different in structure.

The tumour of the right ovary closely resembled the left in colour, when fresh, but was much smaller. The Fallopian tube and broad ligament showed very plainly on its surface. Horizontally, it measured two and a half inches, vertically one and a half. It has shrunk and become much puckered through the action of spirit.

Portions of the wall of the left tumour were carefully removed when the specimen was fresh and prepared for the microscope. When viewed by the naked eye, each section appeared as a wide-meshed network, with trabeculæ very fine in parts but elsewhere stout. Only in one section was there any considerable tract of solid matter. The spaces were partially filled with semi-transparent material. Under a half-inch objective the trabeculæ appeared to consist of a multitude of small round-cells in a homogeneous matrix. Evidences of the formation of cysts, or rather cavities, were abundant, especially in trabeculæ of moderate width (Pl. XVII, fig. 2). In the larger trabeculæ and small tracts of solid matter, the stroma was more uniformly made up of the round-cells, with fewer cavities. The thinnest trabeculæ were much altered by the action of reagents, hence their structure was not easily defined. In the parts of the section where these thin trabeculæ prevailed, the tissue appeared to be cavernous,[1] or reticulated rather than cystic; whether this represented a primary or secondary condition will be presently discussed. The semi-transparent material, which formed networks within the cavities, proved to be entirely artificial. It represented the action of reagents on the half-fluid contents of the cavities.

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[1] I use the word "cavernous" to explain the arrangement of the imperfect septa which traversed the sections in all directions. I do not mean to imply that the tissue of the tumour was "cavernous" in the sense understood by the term "cavernous tissue."

In fig. 2, the transparent deposit may be seen at the edge of some of the wide cavities (*l. c.*) simulating, at some points, the deep layers of epithelium seen in glandular growths from multilocular ovarian cysts; but I failed to detect epithelium of any kind.

Under an eighth-inch objective the structure of the trabeculæ and the borders of the cavities showed some interesting appearances, well displayed in Mr. Lewin's sketch (fig. 3). The cells were far less uniform in character than they appeared to be when viewed under a lower power. In the solid areas the uniformity was no doubt greater than elsewhere. Multitudes of small round-cells lay close to each other in parts; in other places they were more scattered. A matrix could be distinguished in the parts where the cells were sparsely distributed. This matrix showed evidences of fibrillation and indications of plain muscle-cells or at least of elongated connective-tissue cells of considerable size. A few fine-walled blood-vessels could also be distinguished.

The round-cells which prevailed in the solid tracts resembled cells which abound in the stroma of the parenchyma, or inter-follicular tissue of the human ovary early in fœtal life. Thus I found multitudes of round-cells in the ovary of a four months' fœtus, in my collection; the cells were rather larger than those seen in this tumour. In the ovary of a seven months' fœtus, also in my private collection, the round-cells, instead of abounding, were found to be scanty and mostly replaced by a delicate fibrillated intertrabecular tissue. In the ovary of a child aged three, the fibres were yet more distinct, whilst the round-cells were almost absent, and in no parts of the section formed anything like a group.

Thus the more solid part of the tumour may be said to consist of embryonic tissue, resembling the normal tissue of the ovary in early fœtal life. The tissue of the tumour was, in fact, younger than that which makes up a healthy ovary in a seven months' fœtus. In an adult a tumour composed of similar tissue would be described as a round-celled sarcoma, essentially malignant. The ascites, the dilated abdominal veins, and the discolouration of the integuments (if not a mere *post-mortem* change) indicated malignancy in the present case. Yet all these three symptoms are exceptionally seen in cases of large but pathologically innocent multilocular ovarian tumours in the adult. In the fœtus this exceptional condition may be yet less rare, for the delicate peritoneum may more readily pour out fluid, and the venous circulation in the abdomen may more easily be obstructed in the embryo than in the adult. Hence the above clinical conditions were no absolute proof of malignancy, although they indicated it. Above all, embryonic tissue in the embryo must bear a different histological and pathological signification to embryonic tissue in the adult, even in the case of a tumour. It is less abnormal, therefore less characteristic of malignancy in the fœtus. Hence the tumour exhibited to-night must not be lightly described as a round-celled sarcoma.

I may here state that during the present year I have examined a remarkable case of undoubted congenital sarcoma in an infant, exhibited by Dr. John Phillips before the Obstetrical Society. There were large growths in the frontal and parotid regions and deposits in some of the viscera. On microscopic examination the new growth was found to bear all the appearances of a round-celled sarcoma. The sections bore a considerable resemblance to parts of the sections exhibited to-night, both in the form of the round-cells and in their arrangement and relations. Nevertheless this fact does not justify me in describing the tumour now under consideration as an ordinary round-celled sarcoma. The ovary at birth is normally far more embryonic in character than are the tissues which were invaded with new growth in the infant exhibited by Dr. Phillips.[1] Hence a tumour of similar appearance in each case may bear a different pathological interpretation.

The narrowest trabeculæ showed uniform collections of round-cells in a matrix for the most part homogeneous. The broader trabeculæ presented certain appearances which were highly instructive, both as regards the stroma and the manner in which the cavities were developed. Fig. 3 shows part of a broad trabecula and the border of a large cavity, being the area marked *h. p.* in fig. 2, as seen under an eighth-inch objective The round-cells, which abounded in all parts of the tumour, are marked *r. c.*; *c.* points to the border of a large cavity, showing how the round-cells fade off into the free space with no signs of an epithelial lining. At *i. c.* a cavity is, I suspect, about to be formed. A collection of round-cells appear, surrounded by a zone of flatter cells. The round-cells are less distinct than at *r. c.*, and in other parts of the section I found similar encapsuled groups (to use a convenient term) actually breaking down in the centre. Let it be granted that cystic cavities continue to be formed in this manner and we can understand how their partition-walls may break down in an irregular manner, and thus form the reticulated tissue which is the chief feature in this tumour. On the other hand, what is the origin of *i. c.*? The structures *f. f. f.* look remarkably like Graafian follicles, as seen in the fœtal ovary. Comparing their borders with the zone of flat cells which encapsule *i. c.*, the observer may be led to believe that the zone represents the epithelial investment of an enlarged follicle. If this be true the enclosed round-cells, if not all the round-cells which compose the tumour, would be of intrafollicular origin.

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[1] A pathological report of Dr. Phillips's case, with drawings, will be found in the 'Trans. Obst. Soc.,' vol. xxx, 1889, p. 334.

I doubt, however, whether any competent observer would be satisfied with the latter part of the above interpretation of the appearances of the sections, which, taking away the middle factor, *i, c.*, would lead to the conclusion that the tumour was developed from the Graafian follicles. I have already noted that the tracts of solid tissue already described, tracts extensive enough to cover three or more fields as wide as that included in fig. 2, histologically resembled the interfollicular tissue in the normal ovary in early fœtal life. In the midst of these tracts were collections of cells which were swelling, becoming transparent, and breaking down. These appearances were also seen at the borders of the large spaces (*l. c.*, fig. 2, and *c.*, fig. 3). Hence it is more probable that the tumour was the result of proliferation of the cells of the stroma of the parenchyma (oöphoron) and subsequent cyst-formation by breaking down of cells, than that it was of intrafollicular origin. The flat cells around *i. c.* might be of extrafollicular origin or, if follicular, the round-cells which they surrounded might have invaded the follicle from without.

There can be little doubt that *f.*, fig. 2, represents a Graafian follicle. Hence the stroma of the parenchyma of the ovary, the oöphoron, was the seat of the tumour, whether the tumour arose from within or without the follicles. Before turning to the comparison of this tumour to a multilocular cyst in the adult I may note that it could hardly have arisen from relics of the Wolffian tubules. The tumour lay precisely in the anatomical site of the ovary, the broad ligament was normal, and the presence of follicles indicated parenchyma tissue (oöphoron). Into that tissue Wolffian tubules and epithelium normally stray to a limited degree, but follicles rarely, if ever, extend into the hilum tissue (paroöphoron). The stroma of the tumour bore none of the characters of hilum tissue. Admitting, then, that we have to do with parenchyma, the theory that the tumour arose from stray Wolffian elements is hardly tenable. No such elements could be detected, and whereas they tend, under morbid influences, to form papillomatous cysts, bearing well-formed columnar (and sometimes ciliated) epithelium,[1] no papillomatous growths and no distinct epithelium could be detected in this tumour.

Hence there can be no doubt that the specimen is a tumour of the ovary proper, the oöphoron. This suggests an important question. Is it a multilocular ovarian tumour, identical pathologically with that kind of growth so common in adult life?

In the first place, the nature of cases of ovarian tumours in the fœtus already recorded must be taken into account. A large proportion of ovarian tumours in children are dermoid, but I know of no specimen of a fœtal dermoid ovary. The cystic fœtal ovaries preserved in London museums are all examples of dropsical follicles. The fœtal ovarian tumours described by Mr. Sutton and myself[2] were papillomatous and therefore probably of Wolffian origin. In my case, the ovary was hardly enlarged, though the fœtus was of the same age as in the case described to-night. Winckel, in his well-known text-book on diseases of women, figures a congenital cyst of the left ovary in a new-born infant, said to be in a Munich museum. The tumour is represented as cystic in its upper part and solid below, very unlike the present specimen in appearance, and much smaller. The same text-book contains two drawings of microscopic sections of a multilocular solid ovarian cyst in a new-born child. The sections resemble those prepared from similar tumours in the adult ovary. Microscopic secondary cysts, or at least spaces, are represented; they are lined with very distinct well-formed epithelium. The sub-epithelial connective tissue includes large collections of round-cells as in the present specimen. No cavities evidently formed by breaking down of those cells can be detected. Hence Winckel's specimen differs from mine in two respects, the lining of the cavities and the apparent manner of their formation. Nevertheless, I can hardly draw satisfactory conclusions from comparison of a tumour which I have examined with a series of drawings in a foreign text-book.

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[1] See " Proliferating Cysts in the Ovary of a Seven Months' Fœtus," 'Trans. Path. Soc.,' vol. xxxii, 1881, p. 147. Mr. J. B. Sutton has since described a similar case where also "the remains of the mesonephros (Wolffian body) seemed to have completely usurped the true ovarian tissue" ('An Introduction to Pathology,' p. 205).

[2] Ibid.

As I cannot find a precise histological resemblance between my specimen and a multilocular ovarian cyst in an adult, I refrain from tracing to any appearances in this specimen the possible origin of the common ovarian tumour. Aberrations in the development of the follicles (*f.*, fig. 3) may have been the exciting cause of the new growth, but I have already shown that the tumour is mostly, at least, made up of hyperplastic extra-follicular cells belonging to the parenchyma, and of cysts the result of breaking down of those cells. The large central cyst no doubt developed more or less in the same manner as the minute cysts in the wall of the tumour. Lastly, I could not detect any of the different appearances which Mr. Eve, Dr. Vincent Harris, and myself have noted in relatively small ovaries, the fellows of large multilocular cystic tumours removed by operation.

In conclusion, this tumour might be held by some observers to represent certain semi-solid ovarian growths seen in the adult; as, for example, the specimen described in my 'Clinical and Pathological Observations on Tumours of the Ovary,' p. 101, figs. 23, 24, or a case which I once observed in a woman about twenty-five years of age, simulating in some respects round-celled sarcoma. The pathologist would, in the latter instance, recognise a growth made up of round-cells, completely replacing one ovary, or even both ovaries, as in this fœtus; yet he would be bold indeed if, upon some theory of "latency," he were to assert the identity of a pair of tumours which took twenty-five years to develop with a pair which reached a large size before the patient was born, and prematurely born, into the bargain. Possible it may be that the histological development of the ovary may cease to advance at the fourth month, the lowly organised ovarian tissue suddenly undergoing hyperplasia at the age of twenty-five. The fact remains, however, that we do not find, in the bodies of children, histologically ill-developed ovaries lying latent, that is to say, not forming tumours. Again, the evidence of this evening's case tends to prove that histological arrest of development rapidly turns a small ovary into a large tumour.

As the above somewhat minute analysis of the left tumour may be confusing to the reader, I append the following brief recapitulation of the subject:

1. The tumour consisted of a cyst with a solid wall, which was

thin, but thicker than the wall of a common multilocular cyst, and totally different in character.

2. The wall was made up of a highly reticulated tissue, consisting of trabeculæ greatly varying in thickness and spaces which were not true cystic cavities.

3. The trabeculæ were composed of collections of round-cells in a transparent matrix, which in some places showed evidences of fibrillation.

4. This arrangement of cells and matrix recalled the normal structure of the tissue of the parenchyma of the ovary in an earlier stage than that which the patient had in this case attained.

5. Hence the tumour appeared to represent uniform persistence and hyperplasia of the entire embryonic tissue of the parenchyma of the ovary (oöphoron), rather than round-celled sarcoma, which in adults, or even when congenital (Dr. Phillips's case), grows in circumscribed masses where embryonic tissue similar in character does not exist.

6. The evidence that any part of the growth originated within the Graafian follicles was weak; the evidence that it arose entirely from the interfollicular tissue was strong (see 4, 5).

7. The presence of Graafian follicles in some of the trabeculæ proved that the growth was in the oöphoron, and not in the hilum tissue (paroöphoron). Moreover, hilum cysts in the fœtus differ entirely in character from this specimen.

8. The spaces between the trabeculæ and also the great central cyst appeared to be formed by breaking down of the solid matter; these spaces bore no epithelial lining.

9. This tumour bore little or no resemblance to the common multilocular ovarian cyst, and therefore could not throw any satisfactory light on the origin of that well-known form of tumour in which true cystic cavities and epithelial structures abound.

10. This tumour could hardly explain the significance of certain semi-malignant tumours of the ovary in the adult, on the theory that an ovary arrested in its histological development could remain latent for years, suddenly becoming a tumour. Such "latent" ill-developed ovaries are not found in children's bodies, and the evidence of the present case is entirely against latency, as the histological arrest of development turned each ovary into a tumour before the birth of the patient. *October 16th*, 1888.

### 18) **Alban Doran.** Große Geschwülste der Eierstöcke bei einem 7monatlichen Kinde.

(Sonderabdruck aus den Transact. of the Patholog. soc. of London 1889. p. 8. Mit 1 Tafel.)

Das 7monatliche Kind, dem diese Geschwülste entnommen sind, lebte nur wenige Minuten; die größere Geschwulst gehörte dem linken Eierstocke an und war 6 : 8 cm groß, glänzend fleischroth gefärbt. Sie bestand aus einer etwa 5 mm dicken Hülle mit großer Höhle, immerhin war die Haut weit dicker als diejenige gewöhnlicher Kystome. Das Gewebe derselben war maschig, die Balken selbst waren zwar dünn, aber fest, die Maschen an einzelnen Stellen ausgefüllt mit einer halb durchscheinenden Masse. Die mikroskopische Untersuchung zeigte, dass die Balken aus kleinen, dicht stehenden Rundzellen bestanden, dazwischen eine Grundmasse, die meist sparsam war, an Stellen, an denen die Zellen weniger dicht lagen, aber Spuren von faserigem Bau zeigte, etwa Muskelzellen oder wenigstens stark verlängerten großen Bindegewebszellen ähnlich, auch dünnwandige Blutgefäße waren zu unterscheiden. Die Rundzellen ähnelten am meisten denen des Eierstocks in früher Zeit des fötalen Lebens, wo dann sich auch die fibrilläre Struktur des Zwischengewebes vorfindet. Es schien demnach der harte Theil der Geschwulst aus normalem Eierstockgewebe einer noch früheren Zeit zu bestehen. Dennoch war große Ähnlichkeit mit dem Bau eines Rundzellensarkoms vorhanden, wie auch der vorhandene Ascites, die erweiterten Venen und die Verfärbung der Bauchhaut auf Bösartigkeit der Geschwulst hinwiesen. Die Hohlräume zwischen den Balken entstanden durch Entartung der Rundzellen zu einer durchscheinenden (colloiden? Ref.) Masse. Centralbl. f. Gyn. Nov 20/[illegible] Lühe (Demmin).

Trans. Path. Soc. Vol. XL. Pl. XVII.

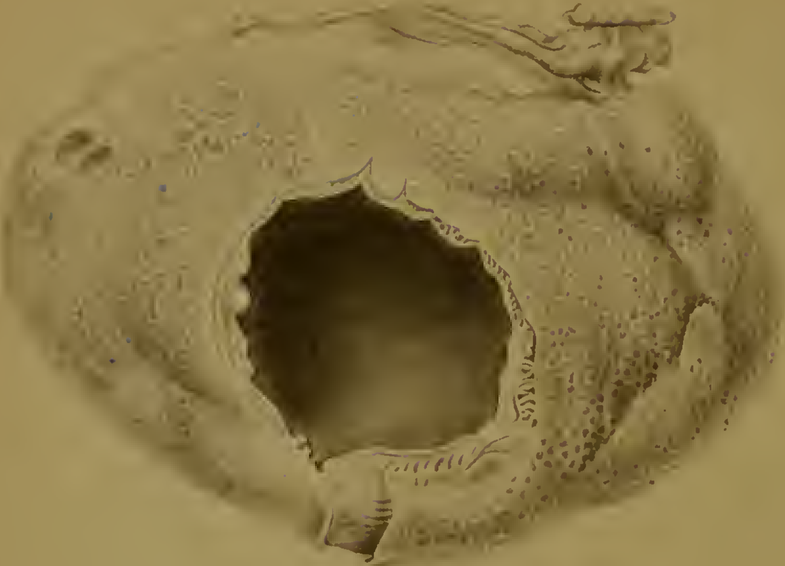

Fig. 1.

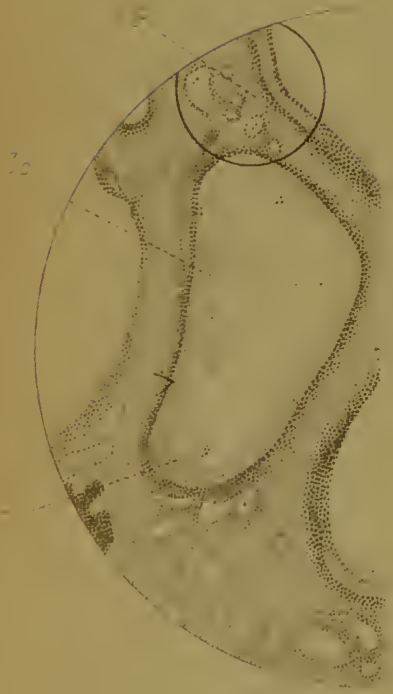

Fig. 2.

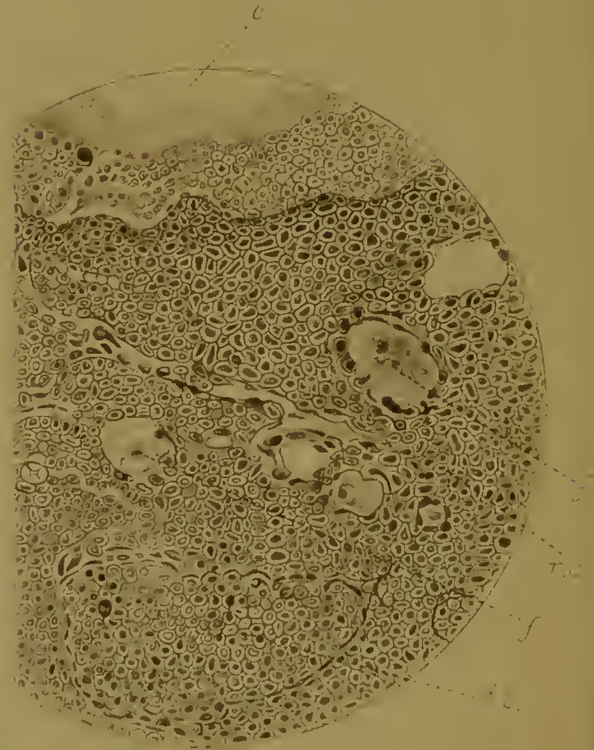

Fig. 3.

## DESCRIPTION OF PLATE XVII.

### To illustrate Mr. Doran's case of Ovarian Tumours in an infant.

FIG. 1.—The left tumour as it appeared when fresh. Natural size. From a coloured sketch by Mr. Lewin. The Fallopian tube lies above, the cavity of the tumour is exposed by a large aperture, along the edge of which the peculiar reticulated or cavernous structure of its wall is displayed.

FIG. 2.—Portion of the left tumour, as seen under a low power ($\frac{1}{2}$ inch objective), showing large spaces and broad trabeculæ.

*l. c.* Transparent material lining a space or cavity.

*h. p.* Are represented in Fig. 3 under a higher power. The trabeculæ appear to be made up of round-cells.

FIG. 3.—The area, *h. p.*, Fig. 2, as seen under a high power ($\frac{1}{8}$ inch objective).

*r. c.* Round-cells closely packed.

*f f f.* Graafian follicles.

*i. c.* Incipient cavity, the round-cells becoming transparent and surrounded by an oval chain of flatter cells (see text).

*c.* Cavity, as they approach its border the round-cells become gradually fainter. No epithelial lining can be detected.

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See back

# Other cases of Ovarian Tumour in Childhood

Riedl, Hermann. "Menstruatio Praecox und Ovarialsarcom." Wiener klin. Wochenschr. 1904. p. 942 (No 35) & Rev. de Gyn. et de Chir. Abdom. Vol viii 1904 p. 826. Menstruation began at 4, breasts & pubic hair developed at 6 an abdominal tumour was observed. Op.: Brenner (Linz) A cystic round-celled sarcoma of lt. ovary removed, as big as adult head & 2 kilos (4 4/5 lb) wt. Labia as big as in a girl aged 17. Recovery – recurrence noted 4 months later (The rt ovary was "slightly cystic" when inspected at the operation)